

# FOREST STRUCTURE, COMPOSITION, AND BIRD COUNTS IN WINDBLOWN AND CONTROL SITES IN KIELDER FOREST, NORTHUMBERLAND, UK, MAY-JULY 2022.

## EXPERIMENTAL DESIGN AND FIELD PROTOCOLS

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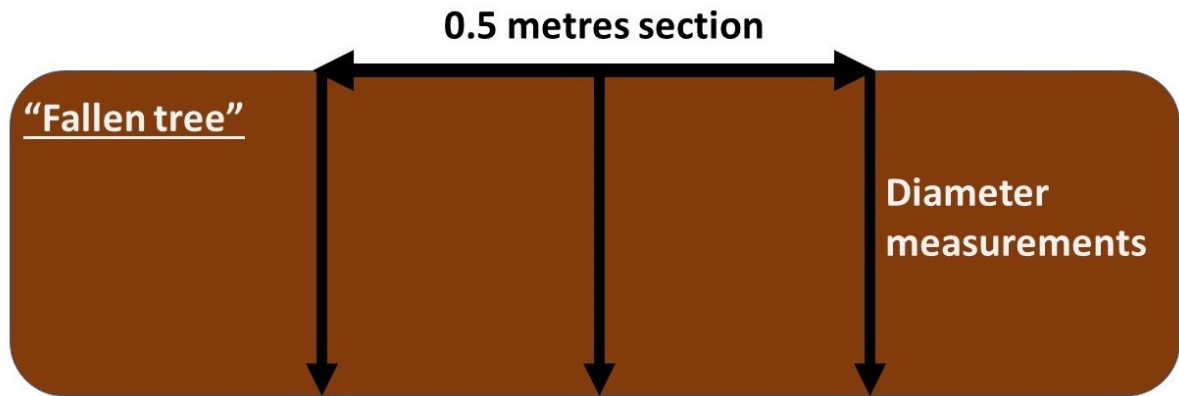
We investigated the impact of storm Arwen (November-2021) on the forest structure and biodiversity of Kielder (Northumberland, UK) following a paired design with relatively close pairs of windblown and control patches. Surveys were conducted at 12 control-impact pairs (24 sites in total), whereby impact sites were those severely affected by Storm Arwen. Within each site, we carried out one (1) 100-m transect, three 10x10-m plots, three 2x2-m quadrats, and 2-4 bird point counts depending on the size of the site.

The 12 pairs of survey sites were chosen to balance accessibility, risk to researchers, and environmental representativeness.

### *Survey Protocols*

In each of our survey sites, we counted and measured all fallen trees found along a 100-m transect. We measured the perimeter of each fallen tree three times to allow for volume estimation (Figure below), and recorded whether the tree was flat on the ground or leaning, and if it was dead or alive (Figure below).





Along each transect, we deployed three 10x10-m plots where we counted and measured the diameter at breast height of trees. These plots were placed at 0-10, 50-60, and 90-100 metres along the transect. We visually estimated the cover of grasses, shrubs, ferns, mosses, fungi, and lichens using the Braun-Blanquet scale inside 2x2-m quadrats at 0-2, 50-52, and 90-92 along our 100-m transects. We also inventoried plant species found within these 2x2-m quadrats. Plants, including trees, were identified using field guides and keys and supported occasionally with photographic-aided identification using the iNaturalist application (<https://www.inaturalist.org/>).

These 10x10-m plots and 2x2-m quadrats were randomly placed on the right or left-hand side of the transect to ensure randomness and representativeness. Within each transect, plots and quadrats were sequentially placed on each side, so if for example the initial plot and quadrat were on the left side, then the second plot and quadrat were on the right, and the third on the left-hand side again.

The Braun-Blanquet scale for estimating cover was defined following these categories:

- +: < 1% cover.
- 1: 1-5% cover.
- 2: 6-25% cover.
- 3: 26-50% cover.
- 4: 51-75% cover.
- 5: 76-100% cover.